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Geoenvironmental Engineering and Technologies

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April 25, 1991

Mr. Mike Kuntz
Washington State Department of Ecology
M/S PV-11
Olympia, WA 98504-8711

RE: RESPONSE TO WASHINGTON STATE DEPARTMENT OF ECOLOGY COMMENTS ON THE COLBERT LANDFILL QUALITY ASSURANCE PLAN FOR METEOROLOGICAL MEASUREMENTS

Dear Mr. Kuntz:

This letter was prepared by Landau Associates in response to Washington State Department of Ecology (Ecology) comments on the Colbert Landfill Quality Assurance Plan (Plan) for Meteorological Measurements, provided in your January 31, 1991 letter. Your January 31 letter states that the Plan is in agreement with Air Quality Program Guidance, but Ecology has concerns regarding validation, auditing, and inspection. Because the Plan meets Air Quality Program Guidance, we do not intend to modify the Plan at this time. Instead, Ecology's concerns are addressed in this letter.

The following are the comments presented in your January 31 letter, and responses to these comments prepared by Landau Associates in conjunction with Mr. Thomas Lockheart of the Meteorological Standards Institute (MSI).

Ecology Comment No. 1):

The action taken when data fails a Quality Control (Q/C) check should be clarified. A stronger statement defining the errors which will cause data to be discarded should be incorporated. Infrequent Quality Assurance (Q/A) checks increase the risk that large periods of data, perhaps back to the previous Q/A check, may have to be discarded if unresolved Q/C failures are allowed to accumulate.

Response to Ecology Comment No. 1):

It is difficult to clarify appropriate action to be taken in the case of data deficiencies caused by errors or failures. It is also difficult to delineate the errors or failures that will cause data to be discarded without first evaluating the specific cause of such errors or failures, the

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effect of such errors or failures on data quality and useability, and the corrective actions that may be available to render the data useable. The following two examples illustrate these points:

1. Assume the wind speed threshold is found to be 0.7 meters per second (m/s) during an audit. It was measured by the starting torque method and recorded as 0.4 m/s at the previous calibration six months earlier. If the data are to be used in a model that forces all speeds below 1 m/s to 1 m/s, the failure is moot for that application. Hourly averages should be flagged as questionable when lower than 1 m/s in this example. Wind speed averages above 1 m/s are valid. If questionable hours impact decisions, consider that the true wind speed will be higher than the flagged values, and this failure would be conservative for air quality modeling purposes. Consequently, it may not be necessary to discard all the data for six months because of this failure.
2. Assume the "as-found" orientation was 35 degrees off TRUE NORTH for the audit and the alignment pin on the sensor was not engaged in the locator slot. When the sensor is moved until the pin is in the slot, the orientation is within 2 degrees of TRUE NORTH. During the time since the last calibration or audit, when the orientation was recorded as correct, the sensor was removed once. A reasonable assumption is that the operator failed to seat the orientation pin properly when reinstalled. Since the sensor was found to be securely fastened to the mount, it can be assumed that the error is a true bias and that the direction data collected subsequent to the erroneous reinstallation of the sensor can be corrected. If the sensor had been removed two or more times, additional analysis would be required before deciding whether or not the data can be recovered.

As illustrated above, the decision to use or discard data that do not meet QC goals is complex and should be addressed on a case-by-case basis. Data that do not meet QC goals will be flagged as questionable. Flagged data will not be used without the concurrence of EPA and Ecology.

Ecology Comment No. 2):

As described in Section 5.0, performance audits will be conducted once a year in place of a calibration. There is no schedule given which indicates if the first audit will take place at the end of one year of operation with audits every year thereafter, or if the first audit may occur sooner than one year of operation, and audits occurring every year from that date. For

example, the first audit might take place at 3 months, with successive audits at 15 months, 27 months, and so forth. It might be beneficial to run an audit early in the operation of the station, so as to minimize the amount of data that might later require compensation for system bias.

Response to Ecology Comment No. 2):

The meteorological station became operable November 21, 1990, and was calibrated by Landau Associates' personnel December 18, 1990. An independent audit of the system was performed by MSI on February 22, 1991. Audit results indicate the system is working well and meeting accuracy and performance requirements, although MSI recommendations for improving documentation of data handling procedures need to be addressed. The audit report and subsequent corrective actions will be provided to Ecology for review in the Phase I Engineering Report.

Present plans call for termination of meteorological station operation after one year of data collection. One additional system audit will be performed at the termination of system operation. Should meteorological station operation be extended beyond one year, system audits will be performed annually on or near the anniversary of the first system audit.

Ecology Comment No. 3):

Section 7.0 states that the data stream from the station will be inspected weekly at the start of operation, and bi-weekly thereafter. However, there is no indication of the duration of the "start of the operation" phase, so it cannot be determined how many weekly inspections this schedule will entail.

Response to Ecology Comment No. 3):

Meteorological data were retrieved from the meteorological station and inspected weekly for approximately three months, from system startup on November 21, 1990, to February 19, 1991. Meteorological data have been retrieved and inspected bi-weekly since February 19, and it is our intent to continue a bi-weekly retrieval/inspection schedule until termination of meteorological system operation.

We trust this letter addresses Ecology's concerns regarding meteorological measurements for the Colbert Landfill RD/RA project. If you have any questions or want to discuss meteorological data collection activities further, please contact Dean Fowler (Spokane County) or me.

Very truly yours,

LANDAU ASSOCIATES, INC.

By:

Lawrence D. Beard, P.E.

LDB/sg
No. 124-01.43
cc: Mr. Dean Fowler, Spokane County
Mr. Neil Thompson, EPA